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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/679,076 | 10/04/2003 | Paul E. McKenney | BEA920030004US1 | 3528 |

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| EXAMINER | |
|---|---|
| BERTRAM, RYAN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2112 | |

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/679,076 | MCKENNEY ET AL. | |
| | Examiner | Art Unit | |
| | Ryan Bertram | 2112 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10/4/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

The disclosure is objected to because of the following informalities: on page 9, line 1, "the memory" is referenced as 308 in the drawings when it is actually 304. The examiner recommends changing the 308 reference to 304.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 18-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 18-20 refers to a computer readable medium which is disclosed as being a modulated carrier signal. Since a modulated carrier signal is neither tangible nor concrete, it is non-statutory.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 12, 18, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

By using the word "utilizing" in claims 1, 2, 11, 12, 18, and 19, the applicant's scope is not able to be ascertained because the word "utilizing" is not further defined by steps within the claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 8, and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Tremblay et al. (US 2004/0162967) hereafter Tremblay.

1. Regarding claim 1, Tremblay teaches a method comprising: utilizing a hardware approach to transactional memory to execute a code section relating to memory (see paragraph [0068]);

and, where utilizing the hardware approach to transactional memory fails a threshold in executing the code section, utilizing a software approach to locking memory to execute the code section relating to the memory (see paragraph [0070]).

2. Regarding claim 2, Tremblay teaches the method of claim 1, further comprising utilizing the software approach to locking memory to execute other code sections relating to the memory (see paragraph [0070]).

3. Regarding claims 3 and 4, Tremblay teaches the method of claim 1, wherein utilizing the hardware approach to transactional memory to execute the code section comprises: starting a transaction inclusive of the code section; and, conditionally executing the transaction; and the method of claim 3, wherein utilizing the hardware approach to transactional memory to execute the code section further comprises, upon successfully completing the transaction, committing execution of the transaction to the memory to which the code section relates (see paragraphs [0064] and [0067]).

4. Regarding claims 5 and 6, Tremblay teaches the method of claim 1, wherein utilization of the hardware approach to transactional memory failing the threshold in executing the code section comprises the hardware approach to transactional memory aborting execution of the code section a single time; and the method of claim 1, wherein utilization of the hardware approach to transactional memory failing the threshold in executing the code section comprises the hardware approach to transactional memory aborting execution of the code section a predetermined plurality of times (see paragraphs [0070] and [0095]).

5. Regarding claim 8, Tremblay teaches the method of claim 1, wherein utilization of the hardware approach to transactional memory failing the threshold in executing the code section comprises utilizing information passed from a compiler to determine whether to utilize the software approach to locking memory to execute the code section (see paragraph [0065]).

6. Regarding claim 10, Tremblay teaches the method of claim 1, wherein utilizing the software approach to locking memory to execute the code section comprises: placing a lock on the memory to which the code section relates; executing the code section; committing execution of the code section to the memory as the code section is executed; and, removing the lock on the memory to which the code section relates (see paragraph [0070]).

Claims 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Scott (US 6,965,961).

7. Regarding claims 18 and 19, Scott teaches an article of manufacture comprising: a computer-readable medium; and, means in the medium for utilizing a software approach to locking memory to execute a code section where a hardware approach to transactional memory has failed a threshold in executing the code section one or more times (see claim 12).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tremblay in view of Rajwar et al. (US 2003/0079094) hereafter Rajwar.

8. Regarding claim 9, Tremblay teaches all of the limitations of claim 1, as well as tracking a success rate of the hardware approach to transactional memory (see paragraph [0097]). However, he does not disclose using this rate to determine whether the software approach to locking memory should be used.

Rajwar teaches a method for speculatively executing critical sections of multi-threaded programs. He discloses using a table with values of historical success of previous execution of certain critical sections (see paragraph [0055]) in order to prevent using a hardware approach to execution if the critical sections will be more likely to be contested with (see paragraph [0021]).

Therefore, it would have been obvious to one have ordinary skill in the art at the time of invention to modify the tracking of a success rate of a hardware approach of code execution taught by Tremblay with the utilization of that success rate as taught by Rajwar in order to prevent using a hardware approach to execution if it is highly likely it will fail.

Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tremblay in view of McKenney (US 2002/0078284).

9. Regarding claims 7 and 11, Tremblay teaches all of the limitations of claim 1, however he does not disclose that the utilization of the software approach to locking memory to execute the code section comprises utilizing one of a queued lock, a non-uniform memory architecture (NUMA) lock, and a reader-writer lock. Nor does he disclose utilizing a digital filter to as the threshold in determining whether to utilize the software approach to locking memory.

McKenney teaches a method for dynamically selecting an optimal lock mode in a multiprocessor environment. McKenney discloses the lock mode in NUMA machines consisting of a reader-writer lock mode, and an exclusive lock mode, which can includes queued locks (see col. 3, lines8-10, and col. 4, lines 10-13), to ensure process synchronization (see col. 2, lines 3-7). He also discloses using a digital filter for taking measurements to determine an optimal opportunity for switching to an alternative locking mode (see paragraph col. 9, lines 51-66).

Therefore, it would have been obvious to one have ordinary skill in the art at the time of invention to modify the software approach to locking memory taught by Tremblay with the specific lock types taught by McKinney in order for an operating system to operate more efficiently, and to determine the optimal opportunity for switching to an alternative locking mode.

Claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tremblay in view of Radovic et al. (US 2004/0098723) hereafter Radovic.

10. Regarding claims 12-17, Tremblay teaches a system comprising a processor having transactional memory capability (see claim 13). He also teaches a system comprising a plurality of nodes interconnected to one another, one of the plurality of nodes inclusive of the processor and the memory (see paragraph [0053-0054]). Tremblay further teaches utilizing a software approach to locking memory where the

transactional memory capability has initially failed a threshold in executing a code section (see paragraphs [0068] and [0070]). However, Tremblay does not disclose the system having memory storing a spin lock/unlock function to execute a code section, nor does he disclose the memory further storing the code section, the code section programmed to call the spin lock function to execute, the spin lock function locking a portion of the memory to which the code section relates.

Radovic teaches a multiprocessing system employing various implementations of software locks. He discloses that the sets of instructions for executing the spin lock/unlock functions may be stored in any type of computer memory in order to provide internode coherency within a multiprocessor system (see paragraph [0026]).

Therefore, it would have been obvious to one have ordinary skill in the art at the time of invention to modify the processor having transactional memory capability and the means for locking memory taught by Tremblay with the computer memory capable of storing code with these means taught by Radovic in order for a multiprocessor system to maintain internode coherency.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scott in view of common knowledge in the art.

11. Regarding claim 20, Scott discloses all of the limitations of claim 18, but does not explicitly disclose wherein the medium is selected from the group consisting of: a recordable data storage medium, and a modulated carrier signal. Official Notice is taken that a recordable data storage medium, and a modulated carrier signal were well known in the art at the time the invention was made. Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching of the well known knowledge into the teaching of Scott to have the medium be selected from the group consisting of: a recordable data storage medium, and a modulated carrier signal because one would want to utilize various types of medium to meet the needs of various types of systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Bertram whose telephone number is 571-270-1377. The examiner can normally be reached on Mon-Fri 8am-5pm ET (Alternate Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RDB

WALTER D. GRIFFIN
SUPERVISORY PATENT EXAMINER